

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1, 15 and 17 are currently being amended. Support for the amendments to claims 1 and 17 can be found at least in FIG. 2, and the corresponding description in the specification. No new matter has been added.

This amendment changes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1, 3-5 and 7-19 are now pending in this application, of which claim 19 has been withdrawn from consideration.

Examiner interview

Applicants appreciate the Examiner Interview of March 1, 2010, with Examiner Ali. Applicants' representative, Thomas G. Bilodeau, discussed the Takeshi reference cited in the rejection of the claims, and explained that Takeshi teaches away from a system where its second coolant of water receives heat of the motor. Examiner Ali asked that more structure be added to the claims to further differentiate from Takeshi. Independent claims 1 and 17 have been further amended to include structure which even more clearly differentiates from Takeshi as explained below.

Rejection under 35 U.S.C. § 103

Claims 1-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 1049234 A2 to Takeshi et al. ("Takeshi") in view of U.S. Patent No. 5,732,769 to Staffa ("Staffa") and U.S. Patent No. 4,576,555 to Ashenfelter ("Ashenfelter"). Applicants respectfully traverse this rejection for at least the following reasons.

Independent claim 1, as amended, recites:

A drive unit for an electric vehicle, comprising:
a motor;
an inverter supplying alternating current electric power to the motor;
a speed reducer reducing a revolution speed of a mechanical output of the motor, the speed reducer comprising a differential gear train distributing the mechanical output of the motor into left and right driving shafts;
a structural member integrally holding the motor, the inverter, and the differential gear train;
first refrigerant receiving heat of at least the motor and outputting the heat into the atmosphere, wherein *the first refrigerant includes cooling water and passes through a first refrigerant passage having a first passage section and a second passage section, the first passage section in contact with at least the motor;*
second refrigerant receiving heat of at least the speed reducer and outputting the heat to the first refrigerant, a cooling performance of the first refrigerant being higher than a cooling performance of the second refrigerant, wherein *the second refrigerant passes through a second refrigerant passage;*
and
a heat exchanger transferring the heat of the second refrigerant to the first refrigerant, the heat exchanger being integrally built in the structural member, being disposed under the drive unit constituted by the motor, the inverter, and the differential gear train, and including *the second passage section being disposed within an inside of the second refrigerant passage, and wherein the first passage section is disposed away from the second refrigerant passage.*

Takeshi fails to disclose at least the above combination of italicized features of claim 1, as amended, where the first refrigerant including cooling water passes through a first refrigerant passage having a first passage section and a second passage section, the second refrigerant passes through a second refrigerant passage, the first passage section is in contact with at least the motor and is disposed away from the second refrigerant passage, and the second passage section is disposed within an inside of the second refrigerant passage.

Takeshi discloses a system with a motor M, inverter U, and heat exchange portion C (See FIG. 1). The Takeshi system has a circulation passage L for a first coolant (oil) for cooling the motor M, and a circulation passage F for a second coolant (water), where the

passage F has the heat exchange portion C with the circulation passage L (col. 6, paragraph [0036]). The Patent Office equates the first and second coolants of Takeshi with the second and first refrigerants, respectively, of claim 1.

Takeshi, in contrast to claim 1, does not disclose a first refrigerant including cooling water passes through a first refrigerant passage having a first passage section and a second passage section, the second refrigerant passes through a second refrigerant passage, the first passage section is in contact with at least the motor and is disposed away from the second refrigerant passage, and the second passage section is disposed within an inside of the second refrigerant passage. In Takeshi, the passage for its second coolant of water does not have a section which is in contact with the motor.

Moreover, Takeshi teaches away from a system where a section of the passage for its second coolant of water is in contact with the motor. In particular, Takeshi discloses in paragraph [0023]:

Because the system is such that the second coolant does not directly cool the electric motor but simultaneously cools the inverter the first coolant which cools the motor by circulation, the heat from the electric motor is reduced with respect to direct heat transfer by heat exchange to the second coolant through the first coolant, and thus it is possible to prevent the temperature rise of the second coolant from rising about the heat resistant temperature of the inverter.

Because Takeshi touts the benefits of not having the second coolant of water directly cool the motor, Takeshi teaches away from a system where a section of the passage for its second coolant of water is in contact with the motor, and it would not have been obvious to one of ordinary skill in the art to modify Takeshi system such that a section of the passage for its second coolant of water is in contact with the motor.

Staffa and Ashenfelter were cited for disclosing other features of the claims, but fail to cure the deficiencies of Takeshi. In particular, with respect to Staffa, even if Takeshi were to be modified such that a section of its passage for its second coolant of water were to be

disposed within an inside of the passage for its first coolant of oil at the heat exchanger, Takeshi and Staffa still in no way suggest that another section of the water passage be in contact with its motor. To the contrary, as discussed above, Takeshi teaches away from a system where a section of the passage for its second coolant of water is in contact with the motor.

Claim 17 has features corresponding to those discussed above with respect to claim 1, and is patentable for analogous reasons.

The dependent claims are patentable for at least the same reasons as their respective independent claims as well as for further patentable features recited therein.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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By 

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